IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Xioa-Peng Liang

Art Unit: 2817

Appl. No.: 10/780,218

Examiner: Stephen E. Jones

Filed: 02/17/2004

Atty Docket: JSF01-0076D1(WJT08-0022D1)

For: **ELECTRICALLY TUNABLE NOTCH FILTERS**

AFFIDAVIT UNDER RULE 1.132

STATE OF MARYLAND)
) SS
COUNTY OF HOWARD)

Dr. Louise C. Sengupta, being duly sworn, does hereby depose and say as follows:

That she is currently the Chief Technology Officer and founder of Paratek Microwave, Inc. That she is an expert in the field of tunable dielectric material and an inventor with 37 issue patents and numerous pending applications relating to tunable dielectric material and devices incorporating such materials therein. That she has been working in the field of tunable dielectric material and devices made therefrom for over 20 years and is recognized throughout the world as a one of the foremost experts in this technology area.

That she has examined in-depth patent no. 6,096,127 entitled, Tunable dielectric films having low electrical losses invented by Dimos et al. That she has examined the instant application serial no. 10/780,218, with particular emphasis on the following claims (this claim is currently amended in the present response as independent claim 1) vis-à-vis the '127 reference.

1. (Currently Amended) A wireless telephone handset comprising:

an antenna connection;

a diplexer coupled to the antenna connection;

a transmit section connected to a first port of the diplexer;

a receive section connected to a second port of the diplexer; and

wherein the diplexer includes first and second notch filters, each of the notch filters comprising a main transmission line, a first coupling mechanism, and a first electrically tunable resonator coupled to the main transmission line through the first coupling mechanism, wherein the first electrically tunable resonator includes a voltage tunable dielectric varactor incorporating tunable dielectric material capable of a permittivity in a range from about 20 to about 2000, and a tunability in a range from about 10% to about 80% at temperatures including room temperature.

7. (Currently Amended) A wireless telephone handset comprising:

an antenna connection;

a diplexer coupled to the antenna connection;

a transmit section connected to a first port of the diplexer;

a receive section connected to a second port of the diplexer; and

wherein the diplexer includes first and second notch filters, each of the notch filters comprising a bandpass filter connected between a termination and one of a circulator or a 3dB hybrid, wherein the bandpass filter includes a voltage tunable dielectric varactor incorporating tunable dielectric material capable of a permittivity in a range from about 20 to about 2000, and a tunability in a range from about 10% to about 80% at temperatures including room temperature.

That based on here analysis, Dimos teaches a technique for increasing the tuning of a thin film material. However, the materials outlined in the Dimos patent cannot be used to obtain the desired properties set forth in the aforementioned claim, to wit:

> incorporating tunable dielectric material capable of a permittivity in a range from about 20 to about 2000, and a tunability in a range from about 10% to about 80% at temperatures including room temperature.

The materials outlined in the Dimos reference fall into two categories: barium titanates that will NOT meet the performance above for use in the filter; and Strontium titanate films that will NOT meet the tuning at room temperature. Dr. Sengupta notes that the referenced Dimos '127 patent does list Q factors for the barium titanate films and only demonstrates Q's for the Strontium Titanate films because these films have inherently high losses or low Qs. Only tuning is given for these films in Figures 5 and 6. She also notes that although no temperatures are given for Figures 7-17, these films are not tunable at room temperature – even though Dimos in his summary of the invention tangentially states "electrical resistivity of the material at room temperature preferably is more than about 1.times.10.sup.9 ohm/cm". She also notes further that in Figures 14-17 these films have superconducting electrodes that will not work at room temperature. Therefore, these materials cannot be used at room temperature operation and achieve the performance set forth above.

Dr. Sengupta states that the referenced Dimos '127 patent does not teach or suggest (alone or in combination with other art) materials that meet the properties set forth above. Further, Dr. Sengupta states that the instant application sets forth in exhaustive detail from page 11 line 16 to page 15 line 8 the tunable dielectric material that Dr. Sengupta and the company she founded have spent many years and millions of dollars to develop and that are capable of the performance set forth in the aforementioned claim and for which the cited Dimos art is incapable of. More specifically, the materials that can fulfill these requirements as outlined in the instant application may be enabled by being either doped or composite tunable films. The variations of the correct compositions are shown on pg 12-13 of the present application.

Lastly, Dr. Sengupta states that the cited Dimos '127 patent shows one planar embodiment of a tunable capacitor in Figure 4 and Figure 6 and that the capacitors of the present application shown in FIGS 11-24 have nothing in common with these capacitors and these capacitors are necessary to produce the required low voltages set forth in the claimed performance parameters above.

Further deponent sayeth not.

Louise C. Sengupta

Louise C. Sengupta

Sworn and subscribed to before me this 12 day of ~~June~~ August, 2005.

Susan Debera Morrison

Notary Public

My commission expires: _____

SUSAN DEBERA MORRISON
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires January 9, 2008